DEPARTMENTAL SEMINAR

Theoretical Sciences

06th January, 2022   **3.00PM**   **ONLINE**

SPEAKER

**Dr. Suddhasattwa Brahma,
Higgs Fellow, School of Physics & Astronomy, University of Edinburgh**

TITLE OF THE TALK

From abstract matrix models to observations in the sky

ABSTRACT

The BFSS matrix model is a proposed non-perturbative definition of M-theory in which space is emergent. In this talk, I shall present a new paradigm of early-universe cosmology in the context of the BFSS theory. Specifically, I will show that matrix theory leads to an emergent non-singular cosmology which, at late times, can be described by an expanding phase of standard Big Bang cosmology. Crucially, the thermal fluctuations in the emergent phase source an approximately scale-invariant spectrum of cosmological perturbations. Hence, this model leads to a successful scenario for the origin of perturbations responsible for the currently observed structure in the universe, while providing a consistent UV-complete description, and naturally overcomes many of the obstacles of the current paradigm of inflation as an effective field theory.

HOST FACULTY
Prof. Amitabha Lahiri
Senior Professor, Theoretical Sciences
****